

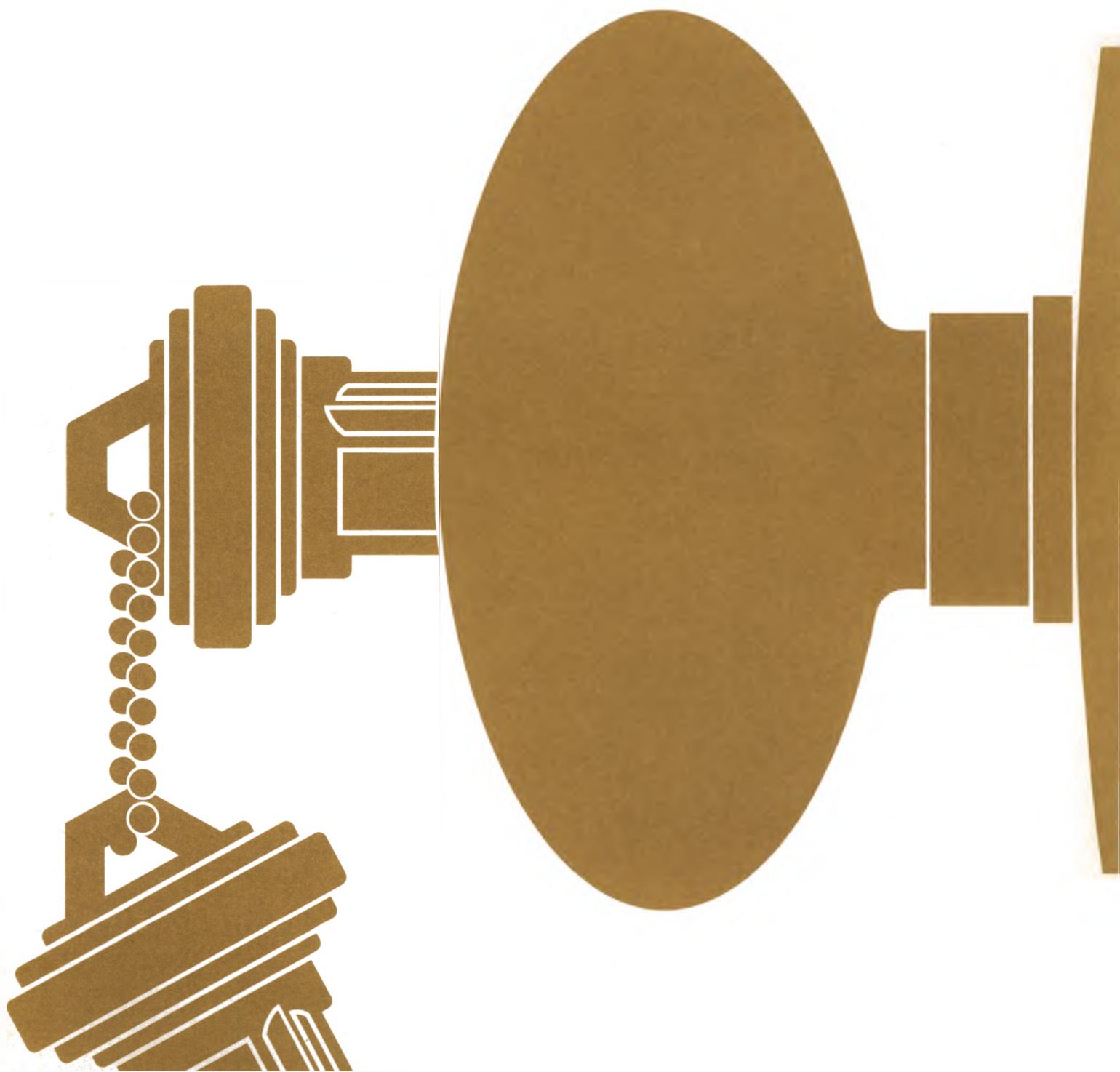
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Rent or Buy? Evaluating Alternatives in the Shelter Market



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U.S. Department of Labor
Ray Marshall, Secretary

Bureau of Labor Statistics
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Acting Commissioner
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Preface

The wide variety of choice in today's shelter market, the mobility of American families, and the opportunities for returns on savings in investments other than housing have all contributed to the complexity of decisions on whether to rent or buy one's shelter needs. As a result, the decision cannot be based on a simple comparison of the monthly outlays for owning and renting. This pamphlet describes a method of analyzing the financial costs and benefits of owning a home compared to renting in combination with a program of regular monthly savings over a specified period of time.

The background information on shelter expenditures and price changes affecting shelter costs was developed from the regular programs of the Bureau of Labor Statistics in the area of prices and living conditions but also incorporates data from other sources.

This pamphlet, first issued in 1974, has been updated to

depict more recent economic conditions that affect shelter decisions. It was prepared by Raymond W. Gieseman, under the direction of Stephen Baer, Chief, Branch of Consumer Expenditure Studies, in the Division of Living Conditions Studies, Eva E. Jacobs, Chief. The text continues to reflect helpful suggestions of Georgena Potts (retired) and Rosalie Epstein of the Bureau's Office of Publications. Credit is also due Daniel H. Ginsburg, Chief, William J. Marshall, and other staff members of the Housing and Services Branch of the Division of Consumer Prices and Price Indexes for their assistance in the project, and to Mary F. Parran for assisting in preparing the final manuscript.

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Introduction

Should I rent or buy?

At some time in your life, you are likely to face a choice between owning or renting a house or other shelter. The decision to own or rent depends on many things. These can be looked at from three aspects:

- What kind of shelter meets your preferences and needs?
- How much is it going to cost and how much can you spend each month for shelter?
- How can you make the best investment of your money while obtaining shelter that meets your needs?

The personal preference aspect. Looking at it from the first aspect, you will want to consider such factors as your age and family status, the stability of employment of the various members of the family, and the likelihood of your moving from one location to another.

Beyond these, the choice has some highly subjective elements. Do you like to “putter around” the house and yard on do-it-yourself projects, or do you dislike having to be responsible for maintenance, small repairs, lawn tending? Is the idea of “putting down roots” and gaining homeowner status in the community important to you?

Because shelter requirements and wants vary widely from individual to individual, from family to family, and from one time to another, it is not possible to make any blanket statement about the kind of shelter that is “best.” It is not likely that anyone else can give you much guidance about the weight to be given to all the different subjective considerations which enter into the decision.

The cost aspect. A second aspect of the shelter decision concerns the costs you will incur and how much you can afford to spend for the kind of shelter you want and need. How different are costs of ownership and rental? Is there any way to compare them? What can you afford to spend?

The amount you spend for shelter is influenced by personal considerations and by your income, both your present income and what you expect it to be in the future. Information on what others spend for shelter is given on page 2. Costs when owning are analyzed in Part II, and Part III provides you with a basis for comparing the costs of owning and renting shelter.

The investment aspect. The third aspect of shelter decisions concerns the prudent investment of your money. Would you be better off investing your money in homeownership over a period of time, or saving your downpayment money and setting aside an amount each month, putting these funds into savings accounts or stocks and bonds, and so on?

This pamphlet is designed to help you analyze these investment factors and apply them to your own situation, so that you can make a judicious decision as to the better course for you to follow. The pamphlet describes and illustrates a technique for estimating the various costs and returns of being a homeowner or renter and then takes you step by step through the decision process with examples and worksheets so you can determine what the alternatives are for you, on the basis of choices and market conditions in your own area. The appendix gives additional details which you will need in working out your examples.

Part I. Differences between owning and renting

Can you afford to own?

If you are thinking of buying a home, you will need enough money to make a downpayment on the purchase. This can be an important barrier to homeownership for families and individuals who do not have adequate savings. On the other hand, when savings are sufficient to allow a choice between buying or renting, there is need to weigh the advantages of investing savings in shelter compared with other investment forms.

Unlike buying, there is no shelter investment requirement when you rent. In addition to saving the downpayment required to buy shelter, renters also do not have the settlement costs that are involved in buying and selling a house.

Renters do not have the long-term commitment to save regularly that homeowners have taken on through long-term financing of their home purchase. However, when the monthly cost to rent is less than to own, renters also have this same opportunity to save regularly. When these savings can be invested along with the savings from initial costs of ownership, returns while renting can be attractive.

How much should you spend for shelter?

Whether you buy or rent, you must consider the proportion of your income you want to spend for shelter. Many elements enter into the decision, varying with individuals, locations, and life styles. There are no hard and fast rules.

Commonly heard rules of thumb suggest that the average family or individual should spend about one-quarter of income for shelter (sometimes stated as "one week's pay out of every month"), and that a buyer ordinarily should look for a house within a market price $2\frac{1}{2}$ times his or her annual income. Data available from actual spending by families give perspective to these conventional rules of thumb and to the suitability of any generalization that would be applicable to all families.

The rules cited above do not include outlays for utilities. However, when comparing homeownership costs with rental rate quotations, it is desirable to use a concept which includes these outlays. Therefore, the term "shelter" as used in this pamphlet has been broadened to include utilities—heat, electricity, water, and sewerage, but excluding telephone.

Information on actual shelter expenditures obtained by the Bureau of Labor Statistics in a national survey of families and individuals in 1972 and 1973 indicates that, on the average, owners and renters spent 18 percent of

their annual income on shelter, including utilities. For homeowners, shelter expenditures averaged 16 percent of income in 1972-73, and included outlays for mortgage interest and principal, property insurance, property taxes, maintenance and repairs, and utilities. For renters, shelter outlays, including utilities, averaged 21 percent, but their income, on average, was 40 percent less than that of homeowners.

Recent homebuyers—those who bought new homes in 1971 and 1972—spent 20 percent of their 1973 income on shelter and utilities. The reported market value of owned homes was 1.85 times annual income for both recent buyers and all homeowners. Average income for recent buyers was 25 percent higher than for all homeowners.

Results of the survey also indicate that higher income families spent a smaller proportion of income on shelter than families with smaller incomes. This was true for both homeowners and renters.

How do tax benefits affect shelter costs?

If you decide to buy shelter, you may benefit by being able to deduct a part of your ownership costs when filing your income tax returns. Amounts spent for interest and taxes are deductible items in Federal and many State and local returns. The amount you save will depend on your income and the amount of other expenses you have to itemize. These savings tend to lower the cost of owning. Renters do not have similar tax benefits for any portion of their shelter outlays.

How do price changes affect costs of owning or renting?

Over time, costs of shelter change in response to price change. Home purchase prices and mortgage interest rates have moved upward in recent years, as have property taxes, property insurance rates, and prices of maintenance and repair items and services, fuel, and utilities.

The impact of higher house prices and mortgage interest rates is felt by home buyers when they seek to establish the amount of the regular payment required to buy a house or condominium. Once the unit is purchased, however, the monthly payment typically becomes fixed and does not vary with future changes in purchase prices or mortgage interest rates.¹ In this way, recent home buyers tend to have

¹Home loans where the monthly mortgage payments change in response to changes in mortgage interest rates are discussed on p. 5.

larger monthly mortgage payments than homeowners who bought comparable shelter in earlier years.

Amounts for other components of homeownership costs—taxes and insurance, maintenance and repairs, and fuel and utilities—have increased over time as a result of price change. Owners with comparable shelter units are affected similarly by these price changes, regardless of when they purchased their homes. All owners experience similar percentage increases in these components of homeowner costs due to price change, but the increase in dollar costs is greater for owners of larger homes than for smaller ones.

Renters also experience the effects of price change as landlords pass on increased costs resulting from higher taxes, insurance rates, maintenance, repair, and service costs, and fuel and utility charges. Landlords may also periodically adjust rental rates to reflect the current market value of shelter units, even though their monthly mortgage payments remain fixed. To the extent this is so, renter costs will increase more over a period of years than will costs for homeowners with fixed monthly mortgage payments.

How does the type of shelter affect the comparison?

The type of shelter you are interested in is an important factor affecting costs and, therefore, the decision to buy or rent. Recent trends in the shelter market have increased the variety of shelter types available for owning or renting. As a result, the comparison of costs and returns between buying and renting can involve similar or widely divergent shelter types.

Between 1960 and 1970, many apartment units were

constructed to accommodate large numbers of young people who were entering the job market for the first time, and young couples who were setting up housekeeping but lacked the resources to buy. Many of these have since acquired some savings and have started families, which make them likely candidates for homeownership. But rising construction costs and higher prices for homesites have made it more costly for them to buy. During the same period the numbers of older individuals and couples whose families were grown also increased. These factors encouraged a wider variety of shelter types. Typical is the trend toward combining the features of apartment-style living with homeownership.

Ownership of condominium and cooperative apartments is growing. Many of these units are attached townhouses or in multi-unit structures (garden style “walk-up” apartments or elevator high-rises). In the condominium form of ownership, the owner-occupier owns a single unit within a structure and shares in the ownership of the grounds and common areas. Under the cooperative ownership plan, each owner-occupant owns a prorated share of the total project. Mobile homes offer still another option of ownership to the prospective home buyer.

Because shelter units for sale and for rent differ widely in type, size, age, location, underlying financing, and so forth, you may seldom have the opportunity or the need to determine whether, *for the same quality or quantity of shelter*, it is cheaper to own or rent. But there is need for some method of comparing costs and returns for types of shelter that meet your requirements. Parts II and III provide a basis for such a comparison.

Part II. Analyzing shelter costs and returns

The amount you can spend for rent and be as well off—from the viewpoint of investment—as if you owned your home, over a specified number of years, depends upon a number of factors. These include (1) the terms of purchase for shelter that meets your needs; (2) the monthly outlays required to retain and maintain your home; (3) the tax savings you experience as a homeowner; (4) your estimate of net proceeds from the sale of your home after a given number of years; and (5) the plans you make for alternative use of your money. The following sections provide background information on each of these factors and several examples to illustrate the analysis.

Terms of purchase

Few home buyers can buy a house outright. They have to borrow, arranging for the purchase in one of the following ways: (1) Conventional financing; (2) financing guaranteed by the Veterans Administration (VA)—available only to veterans; and (3) financing insured by the Federal Housing Administration (FHA). Conventional loans are made by private lending institutions (primarily banks and savings and loan companies), according to terms agreed to by the borrower and the lender. VA and FHA loans are also financed by private lenders, but are subject to government regulation, and the lender is insured against possible default in payment.

Downpayment. The downpayment depends on the appraised value of the property and the amount the lender agrees to finance. There are no minimum downpayment requirements for conventional loans, but the amount commonly runs between 10 and 30 percent of the appraised value. The downpayment for government-backed loans is also determined by agreement between the borrower and the lender, but minimum requirements have been established by law. Under recently approved legislation governing FHA loans, the buyer must pay at least 3 percent down on the first \$25,000 and 5 percent on the excess over \$25,000. The mortgage must not exceed \$60,000. There is no minimum downpayment required for VA loans unless the asking price exceeds the appraised value of the property.

Settlement costs. Another item of cost in buying a house is settlement. These costs occur when property is exchanged. They include closing costs, loan discounts, prepaid items, and sales commissions. *Closing costs* are charges for

obtaining the mortgage loan and transferring the real estate title. A *loan discount* is a charge assessed by a lender to improve his return (these are sometimes called *mortgage points*). *Prepaid items* are amounts required for advance payment of real estate taxes, insurance premiums, and other assessments such as fees paid for improvements to sidewalks, roads, and sewers.

For buyers, settlement costs include closing costs and amounts required for prepaid items. The settlement costs for sellers are loan discount payments and sales commissions.

Settlement costs vary from locality to locality and with the purchase price of the house. In a study of applications received for government-backed loans during March 1971, settlement costs (including loan discount payment, if any) averaged \$1,937 or about 10 percent of the contract sale price.² The study stated: "It is apparent that the two most expensive settlement cost items were loan discount payments, or points, and sales commission. Neither of these costs, however, was paid by the buyer at closing. Therefore, buyer settlement costs represented only about 23 percent of total settlement costs. The seller absorbed more than three-quarters of total settlement costs and probably attempted to recapture some or all of this expense through an increased sale price." Thus, settlement costs amounted to about 2 percent of the market price for the buyer and 8 percent for the seller. Comparable data were not available for homes with conventional loans.

Mortgage term. The term of the mortgage may differ with the three types of loan programs. For example, in 1977 mortgage terms for conventional loans averaged 28 years for new houses and 26 years for existing houses, while 99 percent of the VA-guaranteed loans on new houses and 93 percent of the loans on existing houses had mortgage terms of 26 to 30 years. The full term for FHA loans on new houses in 1977 averaged 30 years and for existing houses, 29 years.

Mortgage interest rates. In recent years mortgage interest rates have fluctuated considerably for all types of loans. Rates are usually different for government-guaranteed loans and conventional loans. Ceiling rates for FHA- and VA-

² *Report on Mortgage Settlement Costs* (Washington, U.S. Department of Housing and Urban Development, and Veterans Administration, January 1972).

Table 1. Interest rates for FHA, VA, and conventional loans, 1976-78

FHA		VA		Conventional	
Date set	Ceiling rate	Date set	Ceiling rate	Year	Contract interest rate
January 1976	8¾	January 1976	8¾	1976	8.92
March 1976	8½	March 1976	8½		
October 1976	8	October 1976	8		
May 1977	8½	May 1977	8½	1977	8.83
February 1978	8¾	February 1978	8¾	1978 ¹	9.09
May 1978	9	May 1978	9		
June 1978	9½	June 1978	9½		

¹ January-June.

guaranteed loans are established jointly by the respective agencies and are announced by the Secretary of Housing and Urban Development. Rates on conventional loans are regulated by State governments. Ceiling and contract interest rates for loans on existing houses since 1976 are shown in table 1.

When the going interest rate is above the State or Federal ceiling rate, it is sometimes necessary to pay a loan discount, or "mortgage points", in order to obtain a loan. The additional charges for mortgage points are normally assessed at the time of settlement and are included in settlement costs, discussed earlier.

FHA-backed loans are subject to an annual insurance premium of one-half of 1 percent of the mortgage balance owed. Some lenders may also require private mortgage insurance on conventional loans. Premiums will vary with the individual insurer.

Effects of terms on cost of financing. For most home mortgages, the amount borrowed is repaid (amortized) with a series of equal monthly payments over the life of the mortgage. The price and amount paid down on a home determine the size of loan required. The mortgage term and the rate of interest which prevails at the time of purchase determine the amount of the monthly payment and total cost of financing such a loan. The following example illustrates how the cost of financing is affected by the mortgage term and the interest rate.

Suppose a \$55,000 home is purchased with a \$5,000 downpayment and the balance is financed for 20 years at 9 percent interest. The monthly mortgage payment will be \$450 and the total outlay for the loan will be \$108,000, of which \$63,000 is interest. Increasing the mortgage term from 20 to 30 years lowers monthly payments to \$402.50, but increases the amount paid in interest by \$36,900, making the total outlay for the loan \$144,900. Similarly, increasing or decreasing the mortgage interest rate affects both the monthly payment and the total cost of the loan. For additional information to help you evaluate the cost of financing home loans, see table A-1 in the appendix.

Other types of loan amortization plans may be encountered in the marketplace when you are investigating home purchase. Some of these contain provisions for varying the amount of interest charged on the loan. Others provide for lower monthly mortgage payments in the initial years of ownership. The lender may offer a loan discount on some of these plans.

Loans which contain provisions enabling the lender to vary the rate of interest charged on the loan in response to changes in prevailing market interest rates are generally called "variable rate mortgages." When the interest rate changes, either the amount of your monthly payment changes, or the mortgage term is adjusted, or both. If the monthly payment changes, this affects your monthly shelter costs. If the mortgage term changes, it affects the amount you still owe on the loan and, therefore, your net proceeds if you sell the house before the mortgage is retired. Of course, when interest rates remain stable, your shelter costs and returns when owning can be analyzed in exactly the same way for a variable rate mortgage as for a loan with equal monthly payments.

First-time home buyers may find ownership "more affordable" if their home loan calls for lower monthly payments in the earlier years. These lower payments are, however, offset in later years with higher monthly payments, which should be anticipated when analyzing your shelter costs over time. The lower initial payments will also affect the amount still owed on the loan if you sell your house before the loan is fully retired.³

Gross monthly outlays of homeowners

In addition to the monthly mortgage payment, other shelter outlays incurred on a regular basis are those for real estate taxes, property insurance premiums, costs of maintenance and repairs, and allowances for fuel and utilities.

³For additional information on various loan types, see such sources as *Federal Home Loan Bank Board Journal*, Feb. 1976.

Excluded from this discussion are major improvements to house and grounds.

Estimates for some types of costs—taxes, insurance, and utilities—usually can be obtained from the seller or the real estate agent. (Also, assessments and tax rates are matters of public record and can be verified in the appropriate office of local government). Maintenance and repair costs are more difficult to estimate for a particular house. In the 1972-73 BLS Consumer Expenditures Survey, expenditures by homeowners for maintenance and repairs averaged between eight- and nine-tenths of 1 percent of the market value of their homes.

Monthly mortgage payments for principal and interest established at the time of purchase usually do not change during the life of the mortgage unless the loan is refinanced. Property taxes, however, as well as insurance rates and prices of maintenance and repair items and services, are not fixed. Table 2 shows year-to-year changes over the last decade for these items and for fuel and utilities.

Effects of tax savings on shelter costs of homeowners

One of the potential benefits of homeownership is a reduction in the amount of personal income tax that must be paid. Interest paid on the mortgage and the real estate taxes assessed against the property are tax deductible under Federal and most State and local income tax regulations, if deductions are itemized.

The effect of these tax savings when prorated monthly is to lower the homeowner's gross monthly outlay for shelter. The amount of such savings depends on the amount of income that would be taxed if deductions were not itemized and on the rate of taxation on this income.

Typically, the amount of interest paid on home loans is highest in the first year and declines over time as the loan balance declines. On the other hand, property taxes tend to rise, due to higher property values and changes in tax rates. Having more property taxes to deduct tends to offset the smaller amounts of interest that can be deducted each year a house is owned.

Estimating net proceeds from sale of house

The decision to purchase a house should include an estimate of what the net proceeds would be if the house were sold at some future date. Buying a house usually requires investing some savings at the time of purchase. Further, additional money is regularly invested through the monthly principal payments—sometimes referred to as “forced savings.”

The value of a homeowner's savings in the house depends on the market price of the house at the time of sale, selling costs, and any debts or liens against it. If a house is sold at the original purchase price, net proceeds will be amounts initially invested in downpayment and settlement, *plus* whatever portion of mortgage payments has been applied to reducing the principal, and *minus* selling costs and any taxes owed. However, if the value of the house has risen, the net proceeds from its sale may amount to more than the owner's purchased equity.

For example, assume a \$42,000 house is purchased with a downpayment of \$4,200, and the remaining \$37,800 is financed at 9 percent for 30 years. Settlement costs are \$800. After 10 years, the house is sold for \$75,000 and selling costs are \$6,000 (8 percent of market value). The net proceeds and gain from the sale of the house might look like this:

Sale price of house.	\$75,000
Less amounts owed at time of sale:	
Selling costs	6,000
Mortgage balance owed.	33,640
Net proceeds from sale of house.	35,360
Less amounts invested:	
Downpayment and settlement costs	5,000
Reduction in mortgage balance (principal payments)	4,160
Gain from appreciation.	26,200

Rate of change in market value of owned home. The future market value of a house depends on its location, its age and

Table 2. Changes in Consumer Price Index for all items, selected shelter components, and fuel and utilities, 1969-78

Consumer Price Index item	Percent change from preceding year									Percent change, 1969-78
	1970	1971	1972	1973	1974	1975	1976	1977	1978	
All items	6.0	4.5	2.9	5.9	11.0	9.3	5.9	6.9	7.3	78.0
Shelter item:										
Property taxes and insurance	9.9	7.9	9.8	4.8	0.0	7.6	6.9	10.1	7.4	85.4
Maintenance and repairs	7.6	8.2	4.9	7.8	13.0	9.2	6.6	7.8	7.9	101.5
Fuel and utilities	3.1	7.5	4.5	4.8	19.0	11.7	8.9	11.1	7.8	110.4

NOTE: Changes calculated from published indexes for June of each year. 1978 data are from Consumer Price Index for All Urban Consumers; data for earlier years are from Consumer Price Index for

Urban Wage Earners and Clerical Workers.

SOURCE: Bureau of Labor Statistics.

structural condition, its adaptability to the tastes and needs of buyers, shifts in population, family income, and general economic conditions. Neighborhood and community characteristics also have an effect on its future market value. In some localities, houses on an average may appreciate 6 or 8 percent a year, or more; in others, they may bring less than the amount originally paid. In the example above, the house increased in value from \$42,000 to \$75,000 in 10 years, or an average of approximately 6 percent a year.

Two factors that tend to make homes appreciate in value are (1) rising costs of building new houses and (2) the higher cost of land suitable for housing. When the total cost of new houses goes up, home buyers tend to bid up the prices of existing houses.

The cost of construction for residential structures increased sharply between 1972 and 1977, rising more than 75 percent during the period—an average annual increase of 8½ percent a year. This means that a house built for \$20,000 in 1970 would have cost about \$35,000 to build in 1977.

Another reason for rising home prices is the rise in the value of the land on which the house is situated. In recent years, the scarcity of suitable sites for building in major metropolitan areas has caused land values to increase. Cost of homesites for new and existing homes under FHA-insured loans increased nearly 50 percent between 1970 and 1977.

Rising construction costs and site costs are reflected in the prices of new and existing one-family homes purchased with FHA-backed loans. Between 1970 and 1977 the average sale price for new and existing homes increased nearly 60 percent, or an average of about 7 percent a year. These rates compared with an average annual increase of just over 6½ percent in the prices of all consumer goods and services over the same 7-year period.

The long-term trend is thus for houses to appreciate in value, but of course there is no guarantee that a particular house will do so, particularly during periods of recession. For example, one-family houses in 22 cities declined almost 29 percent in market value between 1925 and 1933. For the same period, the “all items” price level fell 26 percent.

Selling costs. Amounts that have to be paid at the time a house is sold are called selling costs. These usually include a brokerage fee paid to the real estate agent and may include a loan discount payment to enable the buyer to obtain a loan, if the house is sold to a buyer who finances the purchase through a government-backed loan.

The cost of selling a house can reduce the advantage of home purchase. How the buyer fares depends on the length of stay in the house and the rate of appreciation. For instance, if the selling costs amounted to 8 percent of the market price, the owner would have to realize an increase of 8 percent or more in the price of the house in order to recover the investment. If the rate of appreciation was approximately 6 percent a year, the owner would have

to keep the house at least 2 years in order to get back enough to balance out the initial downpayment and settlement costs.

Mortgage balance owed. A final deduction, before net proceeds from the sale of the house can be estimated, is the amount owed on the mortgage.

In most home financing, loans are amortized, or paid off, by a sequence of equal payments over a number of years. Since the loan balance is highest when the loan is first obtained, the amount applied to interest consumes a major portion of the regular monthly payments in the first few years, and only a small amount of the monthly payments goes to the purchase of additional equity. Thus, if a house is sold within 5 or 10 years of purchase, a substantial portion of the proceeds may be needed to retire the balance of the mortgage.

For example, on a 30-year, 9-percent loan, 96 percent of the initial loan amount would still be owed after 5 years of ownership. Even after 10 years of ownership, 89 percent of the principal would remain to be paid. The percent of the loan balance still owed on this loan at different times is shown below:

After 5 years.	96
After 10 years.	89
After 15 years.	79
After 20 years.	63
After 25 years.	39
After 30 years.	0

Appendix table A-2 shows similar percentages for 20-, 25-, and 30-year loans at different interest rates.

Alternative investment opportunities

Some may prefer to put their money to work in other forms of investment, rather than buy a house. Other types of investment generally make it easier to respond to a change in circumstances or to take advantage of changing rates of return.

Downpayment and settlement costs. Invested in a savings account, funds (the equivalent of which the homeowner uses for downpayment and settlement costs) may earn 5, 6, or 7 percent a year, or more. The value of an investment of \$5,000, compounded annually, is shown in table 3 for selected periods and rates of return. For further details on how these amounts were determined, see appendix table A-4.

Thus, at the end of a year \$5,000 invested at 6 percent would have returned \$300 in interest. To gain this same amount in one year, the purchaser who used the \$5,000 to buy a \$42,000 house would have to sell it for enough to recover the investment (downpayment and principal payments, and selling costs), plus the \$300 that could have been earned by investing the money at 6 percent.

Regular monthly saving. When renting, additional savings may be needed to offset benefits homeowners have in being “forced” to save regularly through monthly mortgage principal payments and having houses that appreciate in value over a period of years. These savings are possible when the total cost to rent per month is lower than the monthly shelter outlay to own.

A regular savings program for renters may require more self-discipline than for those who buy. However, the cumulative effect of savings—often overlooked—might provide an incentive for such self-discipline. Regular savings of as little as \$50 a month (\$300 a year) could earn the

Table 3. Value of \$5,000 compounded annually at selected rates of return

Period	5 percent	6 percent	7 percent
1 year	\$ 5,250	\$ 5,300	\$ 5,350
5 years	6,381	6,691	7,013
10 years	8,144	8,954	9,836
20 years	13,266	16,036	19,348
30 years	21,610	28,717	38,061

Table 4. Value of savings of \$50 per month at selected rates of return

Period	5 percent	6 percent	7 percent
5 years	\$ 3,400	\$ 3,450	\$ 3,550
10 years	7,700	8,100	8,550
20 years	20,300	22,650	25,400
30 years	40,750	48,750	58,450

amounts shown in table 4 if invested for the periods and at the rates of return illustrated. These values are based on information provided in appendix table A-5.

The combined value of the \$5,000 investment and of savings of \$50 a month over a 10-year period at 6 percent interest is \$17,054 (\$8,954 plus \$8,100). This amount would accrue to the renter and could partially or fully offset net proceeds from owning and then selling a home. If it were possible to save as much as \$165 per month by renting, the investment amount would total \$35,684 (\$8,954 plus \$26,730) after 10 years and would compare favorably with the net proceeds from owning illustrated in the example on page 6. Average annual yields for selected types of investments are shown in appendix table A-6.

Part III. Comparing investment returns from owning and renting

The following section outlines procedures which can be used to estimate how much you could spend for rented shelter and be as well off, from the viewpoint of investment, as if you bought a house. Over time, as your income and shelter needs change, or if your job requires that you move, you may wish to reconsider your shelter requirements. At that time, regardless of whether you are an owner or a renter, these procedures can be applied to evaluate your new alternatives.

There are six steps in the procedure:

1. Determine the purchase price and terms of financing for a house you would consider buying;
2. Estimate your gross monthly shelter outlay as a homeowner;
3. Estimate your net monthly shelter outlay as a homeowner;
4. Estimate your net proceeds if you were to sell the house at a specified price after a given period;
5. Estimate the amount of monthly savings required to offset net proceeds from owning, if you decide to rent;

6. Estimate the rent level which, in combination with a savings program, would equal your net monthly shelter outlay as a homeowner.

The first three steps help you establish the costs of owning a specific shelter unit that meets your needs and circumstances. Step 4 helps you determine the expected return from owning and then selling the unit after a period of time. Step 5 develops an alternative plan for saving the equivalent of these returns. In Step 6, you determine a rental rate that is comparable with the monthly cost of owning after allowing for the savings plan. Examples are given to illustrate the procedures. Space is provided to assist you in working through the steps for your own situation.

Step 1. Determine the purchase price and terms of financing for a house you would consider buying.

In the examples, the price of the house and terms of financing—loan ratio, interest rate, and mortgage term—typify conditions for house purchase in 1977-78. Examples

Step 1. Terms of purchase and financing

	Example A	Example B	Your example
Sale price of unit	\$52,000	\$52,000	\$ _____
Terms of financing:			
Downpayment:			
Amount	2,100	5,200	_____
Percent of sale price	4.0	10.0	_____
Characteristics of the mortgage:			
Amount borrowed	49,900	46,800	_____
Interest rate (percent)	9	9	_____
Mortgage term (years to maturity)	30	30	_____
Monthly cost of debt service:			
Payment to principal and interest	\$ 402	\$ 377	_____
Mortgage insurance premium (if any) ¹	20	19	_____
Total to debt service per month	422	396	_____
Initial outlay required to purchase:			
Downpayment	2,100	5,200	_____
Settlement cost	800	800	_____
Total initial outlay required	2,900	6,000	_____

¹ The annual premium is one-half of 1 percent of the average loan balance for the year.

A and B differ only by the amount of downpayment. Example A illustrates a minimum downpayment under FHA loan requirements, and Example B uses a 10-percent downpayment. The lower cost for debt service in Example B, \$396 compared with \$422, is due to the larger downpayment.

For your example, you will need to determine the price of the house or condominium apartment to be analyzed and the amount of downpayment required (or that you plan to make). After you subtract the downpayment, the balance of the sale price remaining is the amount to be borrowed. Sometimes part of the settlement costs are also financed; if this is true in your case, this sum should be included in the amount to be borrowed.

To determine the monthly payment, you need to know the rate of interest on home loans and the number of years over which you plan to finance the balance. Then, using the rates in appendix table A-1 and the example illustrating its use, you can determine the amount of the monthly payment.

For your example, you may have an actual estimate of settlement costs received from a realtor or other source. If this is not available, you may want to use an estimate based on a percent of the sale price of the house, such as the 2-percent estimate discussed on page 4.

Step 2. Estimate your gross monthly shelter outlay as a homeowner.

In addition to regular monthly payments to service the home mortgage, your expenses will include property taxes, insurance, and maintenance and repair bills. You may not be billed each month for these costs, but they can be prorated on a monthly basis. You should also estimate average monthly outlays for utilities that would be included in the monthly rent check if you were renting.

In the table below, the "other monthly costs" are 1977 average costs estimated by FHA for a house with an average price of \$52,000.

You will find suggestions to help you estimate monthly amounts for property taxes, insurance, and maintenance and repairs for your example on pages 5 and 6.

By annualizing your gross monthly shelter outlay and comparing it with your gross income, you can decide at this point whether you can "afford" the house you have specified. For the \$52,000 house and 10-percent downpayment (Example B), the outlay and the percentages at selected income levels are as follows:

	<i>Gross income</i>			<i>Your example</i>
	<i>\$10,000</i>	<i>\$20,000</i>	<i>\$30,000</i>	_____
Gross annual shelter outlay . . .	\$7,032	\$7,032	\$7,032	_____
Percent of gross income . . .	70	35	23	_____

Step 3. Estimate your net monthly shelter outlay as a homeowner.

Both mortgage interest and property taxes paid are tax deductible. This frequently makes it worthwhile for homeowners to itemize rather than to use the standard deduction when figuring their income taxes. Examples on page 11 illustrate the potential savings in Federal income taxes for homeowners at different levels of income if they itemize their expenses for mortgage interest and real estate taxes. Not shown here are additional savings which may accrue to homeowners from similar deductions when filing State and local income tax returns.

In the first instance, taxes are figured when there are no deductions for homeownership expenses. The calcula-

Step 2. Gross monthly shelter outlay to own

	<u>Example A</u>	<u>Example B</u>	<u>Your example</u>
Monthly debt service:			
Mortgage payment	\$ 402	\$ 377	\$ _____
Mortgage insurance premium (if any)	20	19	_____
Total to debt service each month	422	396	_____
Other monthly costs:			
Real estate taxes	94	94	_____
Property insurance	12	12	_____
Maintenance and repairs ¹	28	28	_____
Utilities	56	56	_____
Total other costs each month	190	190	_____
Estimated shelter outlay per month:			
Debt service (principal, interest, and mortgage insurance premiums)	422	396	_____
Other costs	190	190	_____
Gross monthly shelter outlay	612	586	_____

¹ Include monthly fees if the unit is a condominium or cooperative.

tions use 1977 rates applicable for married persons filing jointly and claiming four personal exemptions (\$750 each).

In the next illustration, the tax liability with deductions for homeownership expenses is based on the monthly amounts for real estate taxes and mortgage interest shown in Step 2 for Example A. The \$1,128 deduction for real estate taxes is the \$94 shown in Step 2, converted to an annual basis. The \$4,486 deduction for mortgage interest in Example A was obtained by annualizing the mortgage payment shown in Step 2 ($\$402 \times 12 = \$4,824$) and calculating the amount for mortgage interest as a percent of the annual mortgage payment. (According to appendix table A-3, 93 percent of the first year's payment goes to interest. Thus, $\$4,824 \times 0.93 = \$5,486$).

Tax liability without deductions for mortgage interest and real estate taxes

	Your example	
1. Figure your gross income	\$25,000	_____
2. Determine your taxes from tax tables ¹ :		
Tax liability:		
Annual	3,871	_____
Monthly	323	_____

¹ 1977 Federal income tax rates.

The amount for "other" deductions, given as \$2,800 in the illustration, includes charitable contributions, medical and dental expenses, other deductible interest and taxes, and other losses or expenses that can be itemized. This amount was typical for taxpayers in the \$20,000-\$30,000 income range who filed Federal tax returns in 1975.

For itemizing to be worthwhile, the amount you have to itemize must exceed the standard deduction, or "zero bracket amount," as it was called in 1977.

The zero bracket amount is based on your filing status without regard to the amount of personal income. The 1977 amounts were as follows: Married, filing jointly, or as a qualified widow or widower, \$3,200; single, or an unmarried head of household, \$2,200; married, filing separately, \$1,600.

Even without other itemized deductions, the amounts for mortgage interest and real estate taxes shown in the example would merit itemizing ($\$1,128 + \$4,486 = \$5,614$, compared with \$3,200).

The \$117 monthly saving by itemizing mortgage interest and taxes shown at the bottom of the table was obtained by comparing the tax liability with and without allowable deductions for homeownership expenses.

The itemized tax liability for Example B (not illustrated) is \$2,549 annually (about \$212 monthly) so the tax saving by itemizing is \$111 per month, compared with \$117 in Example A.

Tax liability with deductions for mortgage interest and real estate taxes

	Example A (\$402 monthly mortgage payment)	Your example
1. Figure your gross income	\$25,000	_____
2. Itemize your deductions:		
Real estate taxes	1,128	_____
Mortgage interest	4,486	_____
Other	2,800	_____
Total itemized deductions.	8,414	_____
3. Determine excess deductions:		
Total itemized deductions.	8,414	_____
Less standard deduction ¹	3,200	_____
Equals excess itemized deductions	5,214	_____
4. Determine your taxes:		
Method A (from tax tables):		
Gross income	25,000	_____
Less excess itemized deductions	5,214	_____
Equals tax table income	19,786	_____
Tax from tax table ²	2,474	_____
Method B (from tax rate schedules):		
Gross income	25,000	_____
Less excess itemized deductions	5,214	_____
Less personal exemptions (\$750 each)	3,000	_____
Equals taxable income	16,786	_____
Tax from tax rate schedule	2,656	_____
Less general tax credit	180	_____
Equals Federal tax liability	2,476	_____
Monthly tax liability (from Method A or B)	206	_____
5. Monthly tax saving by itemizing mortgage interest and taxes ³	117	_____

¹ The standard deduction was called "zero bracket amount" on the 1977 return.

² 1977 Federal income tax rates.

³ Tax saving equals the difference between monthly tax liability without homeownership deductions and monthly liability with deductions.

Net monthly shelter outlay can then be figured by subtracting the estimated tax saving from the gross monthly

outlay estimated in Step 2. The results for Examples A and B are shown below.

Step 3. Net monthly shelter outlay to own

	Gross income	Your example
	\$25,000	\$ _____
Example A:		
Gross monthly shelter outlay		
(p. 10)	612	_____
Less tax saving (from p. 11), . . .	117	_____
Net monthly shelter outlay	495	_____
Example B:		
Gross monthly shelter outlay		
(p. 10)	586	_____
Less tax saving (not illustrated).	111	_____
Net monthly shelter outlay . .	475	_____

In your example, you can estimate your potential tax savings by refiguring your last year's tax return, using the mortgage interest and property tax rates for your situation. If you used the standard deduction last year, you will need to compile a list of other deductions you could have used and their amounts. When the amount for "other items" you have to deduct equals or exceeds the standard deduction, you benefit from every dollar paid out for mortgage interest and property taxes by itemizing.

Estimated tax savings shown above are based on amounts of mortgage interest and property taxes paid in the first year of purchase. This gives maximum write-off allowance to homeowners, since the amount of mortgage interest paid will decrease as the loan balance declines. It is possible, however, that part of this loss of mortgage write-off will be offset by higher property taxes, as the assessment rate and the value of the house change with time.

Step 4. Estimate your net proceeds if you were to sell the house at a specific price after a given period.

Before you proceed with this step and the steps that follow, it is necessary to determine the length of time over which you want to compare your alternatives when owning and renting. The time span you select becomes your "planning period." In the examples that follow, values for planning periods of 5, 10, and 20 years are shown. Information has been provided to help you work through your own example for a 5-, 10-, 20-, or 30-year period.

Net proceeds represent the amount received from sale of the house, less the costs of selling and less the balance owed on the mortgage. Any proceeds in excess of these expenses represent 1) the return of your equity and 2) gain from appreciation.

It may seem unrealistic to attempt to estimate proceeds from the sale of a house you have not yet purchased, but this step is necessary if you wish to evaluate your likely returns as well as your costs. It requires an estimate of the future market value of the house at the probable time of sale.

Future market value of dwelling unit and selling costs

Several different rates of appreciation are used below to illustrate the future market value of a house priced at \$52,000 in 1977-78 after 5, 10, and 20 years. Your estimate of the rate of appreciation for the house you are considering should be based on local market conditions, present and expected, and should allow for changes in general economic conditions. The data in appendix table A-4 will assist you with your example.

Estimated future market value of house

Appreciation per year	After 5 years	After 10 years	After 20 years
0 percent	\$52,000	\$ 52,000	\$ 52,000
3 percent	60,268	69,888	93,912
5 percent	66,352	84,708	137,956
7 percent	72,956	102,284	201,240
10 percent	83,772	134,888	349,804
— percent, your example	_____	_____	_____

For the future market prices shown above, the selling costs (at 8 percent of the market value of the house) would be as shown below:

Estimated costs of selling house

Appreciation per year	After 5 years	After 10 years	After 20 years
0 percent	\$4,160	\$ 4,160	\$ 4,160
3 percent	4,821	5,591	7,513
5 percent	5,308	6,777	11,036
7 percent	5,836	8,183	16,099
10 percent	6,702	10,791	27,984
— percent, your example	_____	_____	_____

Amount still owed on house

A mortgage loan is paid off at a very slow rate in the early years, but the rate accelerates as the year of final payment approaches. In Example B following, after 10 years the balance remaining to be paid off on the \$46,800 loan is approximately \$41,652. After 20 years, the balance owed is \$29,484, all of which would be retired in the last 10 years of the mortgage. Appendix table A-2 will help you to determine the amount that would still be owed on your mortgage after different periods of time.

Estimated balance owed on mortgage

	Example A	Example B	Your example
Mortgage term (in years) (from p. 9)	30	30	_____
Rate of interest (per- cent) (from p. 9) . . .	9	9	_____
Mortgage balance owed: Initial balance (from p. 9)	\$49,900	\$46,800	_____
After 5 years. . .	47,904	44,928	_____
After 10 years. . .	44,411	41,652	_____
After 20 years. . .	31,437	29,484	_____

Net proceeds from sale of house

The calculations shown here are for a \$52,000 house and a hypothetical 7-percent annual rate of appreciation. The net proceeds follow from estimates made above.

Step 4. Net proceeds from owning

	After 5 years	After 10 years	After 20 years
Net proceeds for Example A:			
Market value of house (from p. 12).	\$72,956	\$102,284	\$201,240
Less selling costs (from p. 12).	5,836	8,183	16,099
Less mortgage balance owed (from above)	47,904	44,411	31,437
Net proceeds	19,216	49,690	153,704
Net proceeds for Example B:			
Market value of house	72,956	102,284	201,240
Less selling costs . . .	5,836	8,183	16,099
Less mortgage balance owed	44,928	41,652	29,484
Net proceeds	22,192	52,449	155,657
Your example:			
Market value of house	_____	_____	_____
Less selling costs . . .	_____	_____	_____
Less mortgage balance owed	_____	_____	_____
Net proceeds	_____	_____	_____

The net proceeds shown in the examples do not take into account the possibility that you may have to pay capital gains taxes on part of your gain.

Step 5. Estimate the amount of monthly savings required to offset net proceeds from owning, if you decide to rent.

If you do not buy a house, you presumably have available the amount of money you would have spent on downpayment and settlement costs. This amount has potential for growth in other types of investment.

In the example below, a \$2,900 investment—the amount of downpayment and settlement costs in Example A, Step 1—grows to \$3,880 in 5 years and to \$9,300 in 20 years, at 6 percent interest a year. A \$6,000 investment (from Example B) grows to \$8,028 in 5 years and to \$19,242 in 20 years.

You can determine this growth potential, at the rate of return you specify, by using the table of compound interest (see appendix table A-4), applied to the amount of the downpayment and settlement costs you specified in Step 1. Appendix table A-6 shows the average annual returns on selected types of investment.

Interest and dividends received during the year are subject to taxation as personal income. You may want to allow for this by specifying a rate of return that is roughly net after taxes. For example, if you anticipate a 6-percent return per year on your money, you may want to use 5 percent when working through your example.

Value of savings not used for downpayment and settlement

Initial investment and rate of return per year	Value of initial investment		
	After 5 years	After 10 years	After 20 years
Example A, investment of \$2,900:			
5 percent	\$3,700	\$ 4,724	\$ 7,694
6 percent	3,880	5,194	9,300
7 percent	4,069	5,704	11,223
Example B, investment of \$6,000:			
5 percent	7,656	9,774	15,918
6 percent	8,028	10,746	19,242
7 percent	8,418	11,802	23,220
Your example, investment of \$ _____ :			
_____ percent	_____	_____	_____

Advantage (or disadvantage) of investing in a house

The value of money not invested in a house (downpayment and settlement costs) plus the interest earned thereon for an appropriate number of years is deducted from net proceeds from owning a house, as estimated in Step 4, to determine the additional savings, if any, needed to balance the investment gain from owning. The examples below are based on net proceeds shown in Step 4 and on initial in-

vestments of \$2,900 (Example A) and \$6,000 (Example B), compounded at 6-percent net return per year.

For short periods of ownership of 1 to 3 years, the cost of buying and selling a house can absorb much or all of the equity acquired. Savings not used for downpayment and settlement costs by renting, plus the investment return

Step 5. Additional savings needed when renting

	<u>5 years</u>	<u>10 years</u>	<u>20 years</u>
Example A, initial investment of \$2,900:			
Net proceeds from sale of house (p. 13)	\$19,216	\$49,690	\$153,704
Less alternative investment, at 6 percent (p. 13)	<u>3,880</u>	<u>5,194</u>	<u>9,300</u>
Net advantage from investment in house.	15,336	44,496	144,404
Additional saving required each month (at 6 percent interest) to offset net advantage of owning ¹ . . .	222	275	319
Example B, initial investment of \$6,000:			
Net proceeds from sale of house	22,192	52,449	155,657
Less alternative investment, at 6 percent. . .	<u>8,028</u>	<u>10,746</u>	<u>19,242</u>
Net advantage from investment in house.	14,164	41,703	136,415
Additional saving required each month (at 6 percent interest) to offset net advantage of owning ¹ . . .	205	257	301
Your example, with initial investment of \$_____:			
Net proceeds from sale of house	_____	_____	_____
Less alternative investment, at _____ percent	_____	_____	_____
Net advantage from investment in house . .	_____	_____	_____
Additional saving required each month (at _____ percent interest) to offset net advantage of owning ¹	_____	_____	_____

¹ Obtained by dividing the net advantage from investment in house by factors given and explained in appendix table A-5.

on these savings, in many cases will equal or exceed the net proceeds from buying and then selling a house.

For longer periods of time, as in the 5-, 10-, and 20-year periods in the illustration, the renter may need to supplement the initial saving from downpayment and settlement costs with a regular monthly amount to maintain parity with the owner.

In 10 years the net proceeds from sale of the house, when purchased with an initial investment of \$2,900 (Example A), exceed the alternative investment of the same amount invested over the 10-year period by \$44,496. However, the advantage can be offset, while renting, by saving an additional \$275 a month. These savings, when regularly invested, plus the alternative investment, balance the returns when renting with those from ownership over the 10-year period. The monthly savings requirement in Example B over the 10-year period (\$257) is lower than for Example A, due to the larger initial investment and interest earned (\$10,746 compared with \$5,194).

Step 6. Estimate the rent level which, in combination with a savings program, would equal your net monthly shelter outlay as a homeowner.

The difference between net monthly shelter outlay as a homeowner (Step 3) and the amount of monthly savings required to offset the gain (or loss) from investing in a house (Step 5) is the monthly outlay for rent which would leave the renter as well off, from an investment viewpoint, as if he had bought a house. In other words, to come out even with the homeowner over a period of time, the renter can spend for shelter only an amount equal to the difference between his investment program and the homeowner's shelter outlay. Of course, there is no assurance that rental shelter will be available in any given locality at a rate which makes this possible.

Results for Examples A and B are given on page 15, when the net shelter outlay per month is based on tax savings for a family of four persons with \$25,000 annual income. In each case, the monthly saving and the balance available for monthly rent equal the net outlay per month to own.

The results indicate that the anticipated time interval is crucial. Thus, a renter who wanted to break even with an owner over a 20-year period would have to save more per month and spend less for rent than a renter who wanted to break even with an owner over a 5- or 10-year period.

In Example B, the lower net monthly outlay to own is due to the larger initial downpayment, which reduces the size of the loan required and thereby reduces monthly payments. Alternatively, a renter investing an equivalent larger initial amount has to save less each month to break even with owning, so the monthly rental rate is nearly the same in the two examples.

Terms of ownership specified in Steps 1-3 have an important bearing on the outcome. For example, a higher mortgage interest rate in Step 1 would increase the gross and net monthly outlay to own. This would increase the

Step 6. Balance available for monthly rent

	Planning period		
	5 years	10 years	20 years
From Example A, with income of \$25,000:			
Net monthly shelter outlay per month to own (p. 12)	\$495	\$495	\$495
Less monthly saving for alternative investment if renting (p. 14)	<u>222</u>	<u>275</u>	<u>319</u>
Balance available for monthly rent	273	220	176
From Example B, with income of \$25,000:			
Net monthly shelter outlay per month to own (p. 12) . . .	475	475	475
Less monthly saving for alternative investment if renting (p. 14)	<u>205</u>	<u>257</u>	<u>301</u>
Balance available for monthly rent	270	218	174
Your example, with income of \$_____ :			
Net monthly shelter outlay per month to own (p. 12) . . .	___	___	___
Less monthly saving for alternative investment if renting (p. 14)	___	___	___
Balance available for monthly rent	___	___	___

balance available for monthly rent for planning periods shown in Step 6. Similarly, a lower mortgage interest rate would lower the balance available for rent.

Note that, in both examples, calculations are based on a 7-percent appreciation for the house (specified in Step 4) and a 6-percent net return on alternative investments (Step 5). Changing the expected rate of appreciation, for example to 8 percent, would have increased the need for regular savings when renting and lowered the balance available for monthly rent. On the other hand, increasing the rate of return on alternative investments tends to lower the need for regular savings and to increase the balance available for monthly rent.

The results of these calculations as shown in Steps 1 through 6 will not, of course, in themselves determine your shelter decision, but they may help you, along with other considerations, to decide among your alternatives.

One closing note. It is important to remember that, over time—

- The personal factors involved in your shelter decision change.
- The cost factors involved in your shelter decision change.
- The investment factors involved in your shelter decision change.
- General economic conditions and the options available in the shelter market change.

If you keep these factors in mind, you will be far more likely to choose wisely when you come to decide whether you should rent or buy.

Overview of results from the Rent or Buy comparison

	Example illustrated		Your example	
	Rent	Buy	Rent	Buy
Preconditions specified:				
Planning period	10 years	10 years	_____	_____
Initial savings or investment	\$2,900	\$2,900	\$ _____	\$ _____
Price of the home		52,000	_____	_____
Amount borrowed		49,900	_____	_____
Mortgage interest rate and term		9%, 30 yrs.	_____	_____
Expected annual rate of appreciation in price of the home		7%	_____	_____
Annual rate of return on alternative investments	6%		_____	_____
Starting financial position	\$2,900	\$2,900	\$ _____	\$ _____
Less amounts for home purchase:				
Downpayment (p. 9)		2,100	_____	_____
Settlement costs (p. 9)		800	_____	_____
Equals savings not used for downpayment and settlement	2,900	0	_____	_____
Net monthly outlay:				
To own:				
Gross monthly outlay (p. 10)		612	_____	_____
Less tax savings (p. 11)		117	_____	_____
To rent (p. 15)	220		_____	_____
To savings (p. 14)	275		_____	_____
Total, net monthly outlay	495	495	_____	_____
Net proceeds from sale of home:				
Sale price (p. 12)		102,284	_____	_____
Less selling costs (p. 12)		8,183	_____	_____
Less mortgage balance owed (p. 13)		44,411	_____	_____
Net proceeds		49,690	_____	_____
Value of savings while renting:				
Savings not used for downpayment and settlement, plus interest (p. 13)	5,194		_____	_____
Regular monthly saving when renting plus interest (p. 14)	44,496		_____	_____
Total value of savings while renting	49,690		_____	_____
Ending financial position	49,690	49,690	_____	_____

Appendix: Supplementary tables for analyzing shelter costs and returns

Cost of financing home loans

Data in table A-1 can be used to estimate the amount of the monthly mortgage payment for any size of home loan. The following example illustrates its use.

EXAMPLE: John Jones needs a \$42,500 home purchase loan which he can obtain at 9 percent per year for 30 years. What are his monthly payments?

ANSWER: $\$8.05 \times 42.5 = \342.13 .

Table A-1. Cost to finance \$1,000, selected years and rates of interest

Rate of interest	Years financed					
	20 years		25 years		30 years	
	Monthly cost	Total cost	Monthly cost	Total cost	Monthly cost	Total cost
5	\$ 6.60	\$1,584	\$ 5.85	\$1,755	\$ 5.37	\$1,933
6	7.17	1,721	6.45	1,935	6.00	2,160
7	7.76	1,862	7.07	2,121	6.66	2,398
8	8.37	2,009	7.72	2,316	7.34	2,642
8½	8.68	2,083	8.06	2,418	7.69	2,768
9	9.00	2,160	8.40	2,520	8.05	2,898
9½	9.33	2,239	8.74	2,622	8.41	3,028
10	9.66	2,318	9.09	2,727	8.78	3,161
11	10.33	2,479	9.81	2,943	9.53	3,431
12	11.02	2,645	10.54	3,162	10.29	3,704

SOURCE: Based on rates published in such sources as *Payment Table for Monthly Mortgage Loans* and *Comprehensive Mortgage*

Payment Tables, publications Nos. 292 and 392, respectively (Boston, Financial Publishing Co.).

Mortgage payments

The tables presented here help determine the rate at which home loans are retired and the percent of mortgage payments used to pay interest in selected years.

The following example shows how table A-2 can be used:

1. To estimate the amount still owed on a mortgage

after mortgage payments have been made regularly for a specified number of years.

EXAMPLE: Lisa Brown just financed \$35,000 through a 30-year home loan at 9½ percent. How much will she still owe on the mortgage after 10 years?

ANSWER: \$35,000 x .90 = \$31,500.

Table A-2. Percent of original loan amount still owed after specified number of years, selected mortgage terms, at different rates of interest

Interest rate	After 5 years	After 10 years	After 15 years	After 20 years	After 25 years	After 30 years
Life of mortgage—30 years						
5	92	81	68	51	28	0
6	93	84	71	54	31	0
7	94	86	74	57	33	0
8	95	88	77	60	36	0
8½	96	89	78	62	37	0
9 ¹	96	89	79	63	39	0
9½	96	90	81	65	40	0
10	97	91	82	66	41	0
11	97	92	84	69	44	0
12	98	93	86	72	46	0
Life of mortgage—25 years						
5	89	74	55	31	0	
6	90	76	58	33	0	
7	91	79	61	36	0	
8	92	81	64	38	0	
8½	93	82	65	39	0	
9	93	83	66	40	0	
9½	94	84	68	42	0	
10	94	85	69	43	0	
11	95	86	71	45	0	
12	96	88	73	47	0	
Life of mortgage—20 years						
5	83	62	35	0		
6	85	64	37	0		
7	86	67	39	0		
8	87	69	41	0		
8½	88	70	42	0		
9	89	71	43	0		
9½	89	72	44	0		
10	90	73	45	0		
11	91	75	48	0		
12	92	77	50	0		

¹ Percentages at this rate of interest are used to determine the mortgage balance owed on 30-year loans in Examples A and B,

discussed on p. 13.

SOURCE: See table A-1.

The following example shows how table A-3 can be used:

1. To estimate the amount of mortgage interest paid in a given year.

EXAMPLE: Harry Smith has a 30-year, 9-percent loan.

His mortgage payments are \$300 per month (\$3,600 a year). How much of the \$3,600 was used to pay interest in the first year?

ANSWER: $\$3,600 \times .93 = \$3,348$.

Table A-3. Mortgage interest as a percent of annual mortgage payments in selected years, selected mortgage terms, at different rates of interest

Interest rate	1st year ¹	5th year	10th year	15th year	20th year	25th year	30th year
Life of mortgage—30 years							
5	77	72	64	54	41	24	3
6	83	78	71	60	47	28	3
7	87	83	76	66	52	32	3
8	90	87	80	71	57	35	4
8½	92	88	82	73	59	37	4
9	93	90	84	75	61	39	4
9½	94	91	86	77	63	41	5
10	95	92	87	79	65	42	5
11	96	94	89	81	68	44	5
12	97	95	91	84	71	48	6
Life of mortgage—25 years							
5	71	64	54	41	24	3	
6	77	71	60	47	28	3	
7	82	76	66	52	32	4	
8	86	81	71	57	36	4	
8½	87	82	73	59	37	4	
9	89	84	75	61	39	4	
9½	90	86	77	63	41	5	
10	91	87	79	65	42	5	
11	93	89	82	68	45	5	
12	95	91	84	71	48	6	
Life of mortgage—20 years							
5	62	54	41	24	3		
6	69	60	47	28	3		
7	75	66	52	32	4		
8	79	71	57	36	4		
8½	81	73	59	37	4		
9	83	75	61	39	5		
9½	84	77	63	40	5		
10	86	79	65	42	5		
11	88	82	68	45	5		
12	90	84	71	48	6		

¹ Only the first-year percentages shown here are used to compare the investment advantages of owning and renting.

SOURCE: *Monthly Payment Direct Reduction Loan Amortization Schedules*, 12th Ed. (Boston, Financial Publishing Co.).

Future value of an investment

Table A-4 can be used to determine the future value of an initial investment of any given sum, at different rates of return and over different time periods. The table may also be used to determine the future cost of an item (or group of items) whose price is changing by a certain percentage each year. The following examples show how table A-4 can be used:

1. *To estimate the future market value of any house or property.*

EXAMPLE: The current market price for a house is \$40,000, and it is expected to appreciate 6 percent a year over the next 10 years due to price change. What would be its price in 10 years?

ANSWER: $\$40,000 \times 1.791 = \$71,640$.

2. *To estimate future value of a fixed sum of money invested at different rates of return for a given number of years.*

EXAMPLE: The sum of \$5,000 is invested for 20 years at a 6-percent return per year. What is the value of the \$5,000 in 20 years?

ANSWER: $\$5,000 \times 3.207 = \$16,035$.

3. *To estimate the future cost of any items of expenditure or expenditures for groups of items whose prices are subject to an expected percentage change (increase) each year.*

Table A-4. Factors for compounding returns and costs, selected interest rates and time periods

Interest rate	5 years	10 years	20 years	30 years
1	1.051	1.105	1.220	1.348
2	1.104	1.219	1.486	1.811
3	1.159	1.344	1.806	2.427
4	1.217	1.480	2.191	3.243
5	1.276	1.629	2.653	4.322
6	1.338	1.791	3.207	5.743
7	1.403	1.967	3.870	7.612
8	1.469	2.159	4.661	10.063
9	1.539	2.367	5.604	13.268
10	1.611	2.594	6.727	17.449

SOURCE: Derived from compound interest tables. For example, see *C.R.C. Standard Mathematical Tables* (Cleveland, Chemical Rubber Publishing Co.).

EXAMPLE: Susan Greene spends \$50 a month (\$600 a year) for utilities, and she expects this outlay to increase 5 percent a year due to price change. What would her monthly utility bill be in 5 years due to this price change?

ANSWER: $\$50 \times 1.276 = \63.80 .

Accumulated savings

Table A-5 presents the factors to be used in estimating the total amount of savings accumulated, over varying periods of time, by investing a fixed amount of money each month at one of three different rates of return. The examples below show how the table can be used:

1. *To estimate the worth of a regular program for saving money.*

EXAMPLE: Alan Baker saves \$50 each month which he invests in a program which he estimates will yield a 5-percent return compounded annually. If he does this each month for 20 years, what will be the approximate value of this savings?

ANSWER: $\$50 \times \$406 = \$20,300$. Of this,
 $\$50 \times 240$ months = \$12,000 savings;
 $\$20,300 - \$12,000 = \$8,300$ interest earned.

2. *To estimate the monthly savings needed to accumulate a specified sum of money over a period of years.*

EXAMPLE: Edna Smith wants to accumulate \$10,000 in savings by setting aside a fixed amount each month for 10 years. If her savings earn 6 percent compounded annually, how much does she set aside each month to acquire the \$10,000?

ANSWER: $\$10,000 \div \$162 = \$61.73$.

Table A-5. Factors for use in estimating accumulated savings, selected interest rates and time periods

Interest rate	Value of savings of \$1 per month in number of years			
	5 years	10 years	20 years	30 years
4	\$66	\$147	\$364	\$ 685
5	68	154	406	815
6	69	162	453	975
7	71	171	508	1,169
8	73	180	569	1,409

SOURCE: See Paul M. Hummel and Charles L. Seebeck, Jr., *Mathematics of Finance* (New York, McGraw-Hill Publishing Co., 1956, pp. 77-88).

Yield on selected types of investment

Table A-6 can be useful in comparing alternative ways of investing a given sum of money.

Table A-6. Average annual yield on selected types of investments, 1964-77

(Percent)

Year	Aaa corporate bonds ¹ (Moody's)	High-grade municipal bonds ¹ (Standard & Poor's)	U.S. Government bonds ¹	Savings accounts in savings associations ²
1964.	4.40	3.22	4.15	4.19
1965.	4.49	3.27	4.21	4.23
1966.	5.13	3.82	4.66	4.45
1967.	5.51	3.98	4.85	4.67
1968.	6.18	4.51	5.25	4.68
1969.	7.03	5.81	6.10	4.80
1970.	8.04	6.51	6.59	5.06
1971.	7.39	5.70	5.74	5.33
1972.	7.21	5.27	5.63	5.39
1973.	7.44	5.18	6.30	5.55
1974.	8.57	6.09	6.99	5.98
1975.	8.83	6.89	6.98	6.24
1976.	8.43	6.49	6.78	6.32
1977.	8.02	5.56	7.06	p6.40

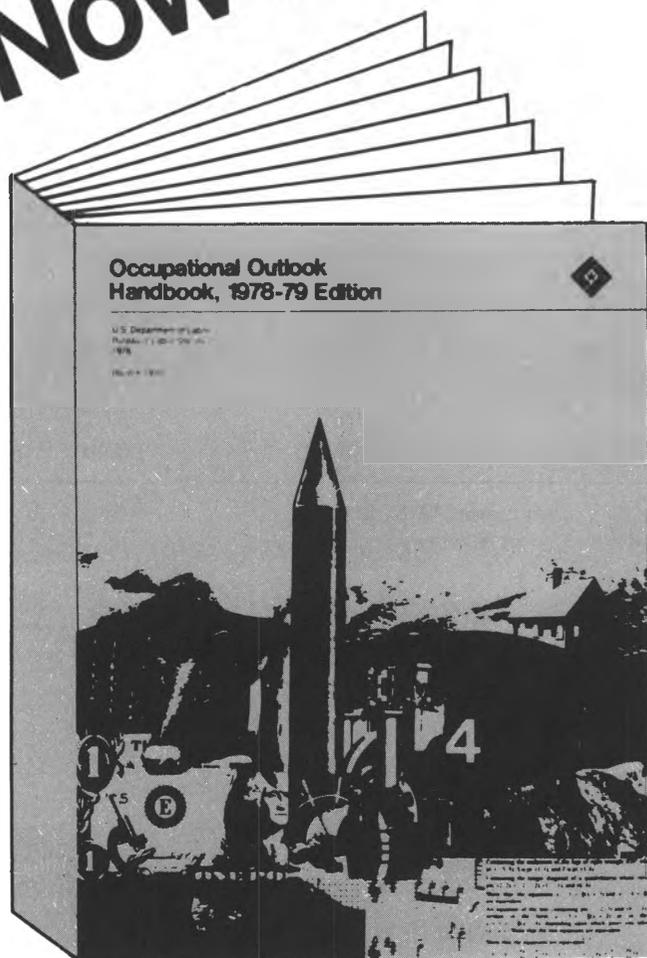
¹ *Economic Report of the President*, January 1978, p. 332.

Loan League, 1978), p. 14.

² *Savings and Loan Fact Book, 1978* (Chicago, U.S. Savings and

p = preliminary.

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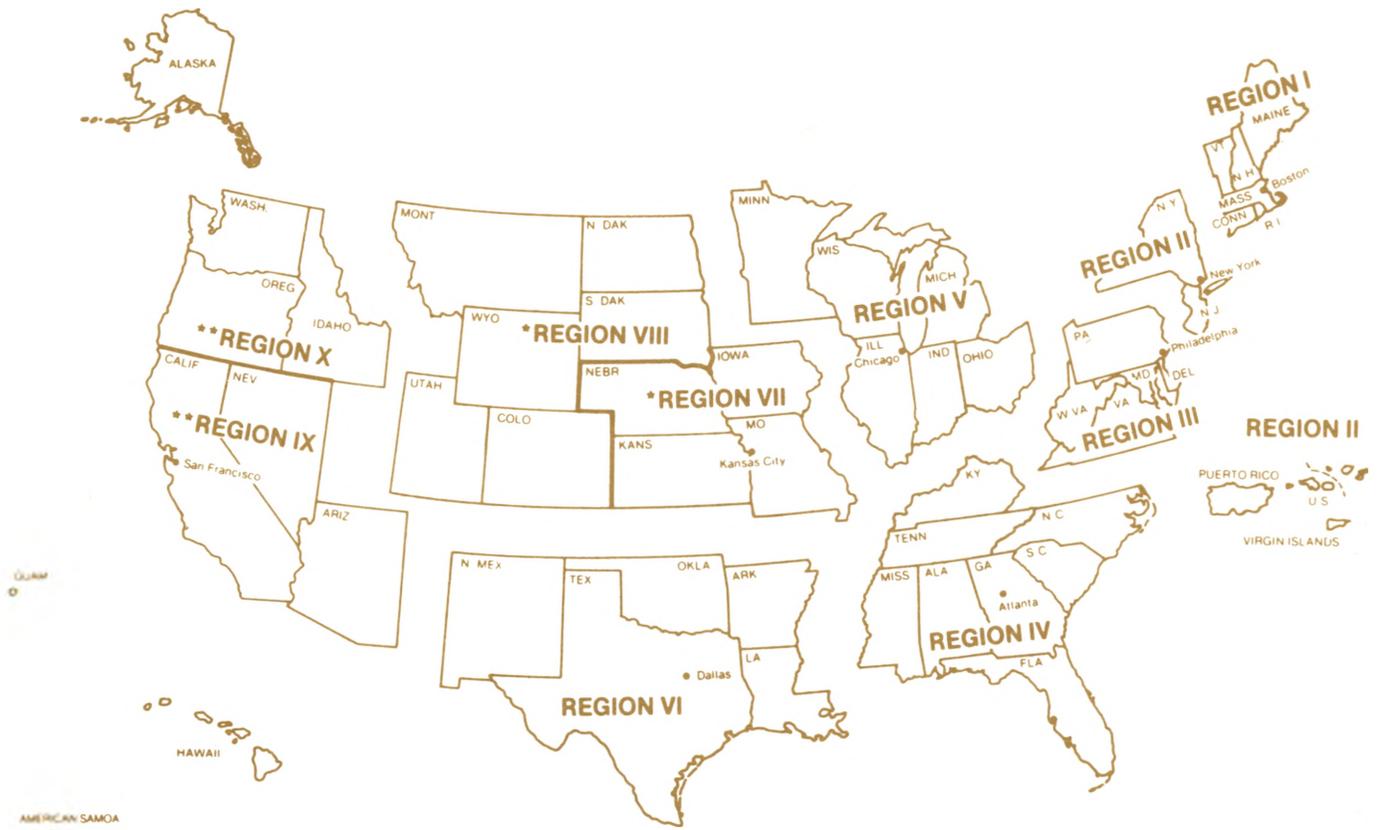
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